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Health & Nutritional Sciences Free Communication Day: Spring 2019 Plan B Abstracts

Viola Davies
South Dakota State University

Jonathan Shaeffer
South Dakota State University

Amy Hommes
South Dakota State University

Zachary Fehringer
South Dakota State University

Andrew Cheney
South Dakota State University

See next page for additional authors

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Author

Viola Davies, Jonathan Shaeffer, Amy Hommes, Zachary Fehringer, Andrew Cheney, Alli DeLay, Alyssa Finke, Kaitlin Reece, Jacob Elfmann, Maggan Froseth, Kala Nurnberg, Keith Thompson, David Andersen, Samantha Kratovil, Makenna Meier, Lezlie Pommer, and Amanda Nack



SOUTH DAKOTA STATE UNIVERSITY

Department of Health and Nutritional Sciences

Health & Nutritional Sciences
Free Communication Day
Student Union 262
April 30, 2019



Free Communication Day

Session 1: 8:00am-8:50am

Effect of supervised aquatic therapy and supervised land-based therapy on chronic low back pain.

Davies V, Roiger TC: South Dakota State University, Brookings, SD

Presenter: Viola Davies

Advisor: Trevor Roiger

Context: Chronic low back pain (CLBP) affects 70-80% of the general population and often presents with no specific cause. Individuals in many cases attempt to reduce their pain through rest. Unfortunately, inactivity weakens the lumbar and core stabilizing musculature and may increase long-term pain. Supervised exercise currently represents the primary intervention for CLBP. **Objective:** Is supervised aquatic therapy more effective than supervised land-based therapy in decreasing pain in otherwise healthy patients with chronic low back pain? **Data Sources:** CINAHL, PubMed, Medline, Google Scholar, and Web of Science were searched for articles. Keywords included hydrotherapy, aquatic exercise, land-based exercise, and [chronic] low back pain. **Study Selection:** Studies that were level 3 or higher, compared aquatic to land-based therapy in patients with CLBP, used pain outcome measures, were written in English, and published between 2008-2018 were included. Studies that were not accessible through interlibrary loan or that compared aquatic therapy to a no-exercise control group were excluded. **Extraction:** Three studies meeting the inclusion criteria were identified, analyzed, and rated according to the Centre for Evidence Based Medicine 2011 Level of Evidence Scale and Strength of Recommendation Taxonomy (SORT). Three level 2 studies were appraised. **Data Synthesis:** There is little evidence to suggest that aquatic therapy is more effective than land-based therapy in decreasing pain in patients diagnosed with CLBP. All studies utilized the Visual Analogue Scale (VAS) to measure pain levels before, during, and after treatments. Two studies reported reduced pain levels for aquatic and land-based interventions while one found that the VAS scores in only the AquaStretch group decreased significantly. **Conclusions:** Supervised aquatic therapy is no more effective than supervised land-based therapy in decreasing pain in patients diagnosed with CLBP. Future research should include long term results, blinding of assessors, and determine if an optimal frequency of exercise exists.

Biography: Viola Davies is a student in the Master of Science Athletic Training (MSAT) program. She is an international student from Germany and has been attending college in the United States since 2014, with one year of job experience as a physical therapy technician in 2016-2017. In the past she has obtained an associate degree of science in athletic training and a bachelor's degree in general studies with the emphasis areas in wellness, allied health, and math/science. Upon completion of her MSAT degree she is planning on finding an athletic training job in a secondary school setting.

The College Football Recruiting Process and Ways to Improve It

Presenter: Jonathan Shaeffer

Advisor: Hung-Ling (Stella) Liu

Objective: The aim of this study is to evaluate the current college football recruiting process through analyzing articles and previous research to determine not only the important of college football recruiting, but also to find ways to improve the process to help current and future college coaches, staff members, administrators and others. **Study Design:** The study looked at many articles that dealt with different factors of the college football recruiting process, such as budget, the recruiting process, the recruiting timeline, coach's evaluation process, NCAA rules and regulations, and reasons recruits choose certain schools over other schools. **Conclusions:** College Football Recruiting is an ever changing business. College Football Staffs need to stay up to date on the ever changing nature of the business. This literature review will give readers a basis of how the college football recruiting process is currently and gives readers a background on why it is important to receive commitments from the best recruits in the country.

Biography: Jonathan Shaeffer is a graduate student finishing up his Master's in Sport and Recreation Administration. He completed his undergraduate degree here at South Dakota State University in 2016 with a Bachelor of Science in Sport, Park, and Recreation Administration. Shaeffer has worked for the Jackrabbit football program for 6 years and currently works as a Recruiting Assistant. He has completed internships with the Minnesota Vikings, Sioux Falls Storm, and Augustana University. His research project titled "The College Football Recruiting Process and Ways to Improve It" looks at the current college football recruiting process, and ways that administrators, coaches, and support staff can improve the recruiting process to benefit the team, the athletics department, and the University.



The Effects of Probiotics on Depression and Anxiety

Presenter: Amy Hommes

Advisor: Elizabeth Droke

Objective: The aim of this review is to evaluate the current body of research on the relationship between probiotics and mental health in order to inform dietetics practice. This review aims to evaluate if probiotics are a viable option for ameliorating symptoms or decreasing prevalence of depression and/or anxiety.

Methods: PubMed was searched for articles published between January 2009 and January 2019 containing the words “probiotics,” “depression,” and “anxiety.” Article were included if subjects were adults, the articles were published in English, and the studies’ primary or secondary outcomes pertained to depression and/or anxiety. Both observational and experimental study designs were considered. Due to the limited body of literature, all comorbid conditions were included in the review.

Results: 25 total articles met the inclusion criteria. Of these 25 studies, 16 found statistically significant benefits of probiotic consumption on anxiety and/or depression-related outcomes. 22 articles explored depression-related outcomes and supplement-sourced probiotics - of these, 14 articles found statistically significant benefits to probiotic use. 18 articles explored anxiety and supplement-sourced probiotics - of these, 10 articles found statistically significant benefits to probiotic use. 4 articles evaluated food-sourced probiotics and depression - one found no effect, two found a benefit, and one showed harm of increased probiotic consumption. Only one article evaluated food-sourced probiotics and anxiety, and this article found a benefit of probiotic consumption on anxiety symptoms.

Conclusions: There is not yet sufficient research to create evidence-based guidelines on probiotic use for dietetics practice. Existing evidence is insufficient to make informed recommendations on specific strains and doses.

Biography: Amy Hommes is a graduate student in Nutrition and Exercise Science. She is participating in SDSU’s Nutrition and Dietetic Internship and will be becoming a Registered Dietitian upon completion. She attended the University of Minnesota previously and earned a Bachelor of Science in Nutrition. After graduation, she hopes to work as a clinical dietitian.

Arthroscopic Partial Meniscectomy versus Physical Therapy: Best Intervention to Improve Outcomes in Patients with Meniscal Tears?

Fehringer ZR, Roiger TC: South Dakota State University, Brookings, SD

Presenter: Zachary Fehringer

Advisor: Trevor Roiger

Context: Evidence indicates 35% of people 50 years of age or older have a meniscal tear. Both physical therapy and arthroscopic partial meniscectomy (APM) represent viable options for managing meniscal tears, with 700,000 APMs performed in the United States each year. A growing concern with APM is the increased risk of developing osteoarthritis (OA); approximately 50% of patients show radiographic signs of knee OA 10-15 years after APM. A leading cause of disability in the United States, OA affects a significant portion of the population with annual costs approaching \$190 million. **Objective:** Are patients who undergo physical therapy for a non-traumatic meniscus tear more likely to experience better osteoarthritis (OA) outcomes than patients who complete arthroscopic partial meniscectomy (APM)? **Study Selection:** Studies of Level 2 evidence or higher that compared arthroscopic partial meniscectomies and physical therapy, included osteoarthritis progression as an outcome, were published in the last 10 years, and were written in the English language were included. Studies that did not report osteoarthritis progression as an outcome or compare arthroscopic partial meniscectomies and physical therapy were excluded. **Data Extraction:** Three studies met all inclusion criteria. Studies were analyzed and rated according to the Centre for Evidence Based Medicine 2011 Level of Evidence Scale and Strength of Recommendation Taxonomy (SORT). One Level 2 and two Level 1 studies were appraised. **Results:** There is no significant difference in functional outcomes or radiographic progression of OA in patients undergoing APM versus physical therapy for non-traumatic meniscal tears. Some patients who elect to pursue physical therapy report suboptimal outcomes and subsequently opt for an APM. **Conclusions:** Given the similar functional outcomes between APM and physical therapy, as well as the added cost and risks associated with surgical intervention, physical therapy represents an appropriate initial line of treatment for patients with non-traumatic meniscal tears.

Biography: Zach Fehringer attended the University of Nebraska at Omaha and graduated magna cum laude in 2017 with a Bachelor of Science degree in Athletic Training. He is currently attending South Dakota State University for graduate



school. He will graduate this May and receive a Master of Science degree in Sport and Recreation Administration. He is a certified athletic trainer with a South Dakota licensure. He is currently working as a graduate

assistant athletic trainer with the South Dakota State University Football team and Equestrian team. He worked with the SDSU Cross Country and Track & Field teams during his first year at South Dakota State University. He recently accepted an Athletic Training Fellowship position with the Duke University Football team, and his future goal is to continue working as an athletic trainer with a Division I Football team.

Session 2: 9:00am-9:50am

Does the inclusion of mental health education programs have an effect on the help seeking behavior of collegiate student-athletes?

Cheney AJ, Zwart MB: South Dakota State University Brookings, SD

Presenter: Andrew Cheney **Advisor:** Mary Beth Zwart

Context: Collegiate student-athletes are susceptible to a variety of psychological issues such as depression, anxiety, and suicidal thoughts. It has been noted that suicide was the third-leading cause of death of student-athletes from 2004 to 2008, after accidents and heart problems. **Objective:** Will the inclusion of mental health education programs affect help-seeking behaviors in collegiate student-athletes? **Data Sources:** An electronic database search was conducted using CINAHL, SPORTdiscus, MEDLINE, PsycARTICLES, PsycINFO, PsycTESTS, PubMed, Research Gate, Journal of Sports Medicine, Journal of Athletic Training, Journal of Clinical Sports Psychology, NCAA.org, NATA.org, and Additional resources obtained via review of reference lists and hand search. **Study Selection:** Inclusion criteria included studies investigating elite or collegiate student-athletes aged 18 or older; effect of mental health education programs on help-seeking behaviors, intentions, or attitudes; were at least level 3 evidence; and limited to the English language. **Data Extraction:** Two cohort studies and one systematic review were identified and appraised according to the 2011 CEBM Level of Evidence Scale. **Data Synthesis:** One study used an interview intervention with varsity and club sport student-athletes. Another used a contact/education intervention with varsity student-athletes at a large Division 1 school, and lastly was a systematic review studying effectiveness of sport-specific mental health awareness programs. Two of the three studies found no significant difference in help-seeking behaviors, but the other did find significance. Based on the information appraised, mental health interventions should be completed at the beginning of a school year, during the preseason meeting, and include an educational component. Delivery method would depend on the specific organization and personnel available. **Conclusions:** There is limited evidence to indicate that mental health education programs have an effect on help-seeking behaviors of collegiate student-athletes. However, the evidence did show that the programs need to be contact and educational based rather than internet based. **Word Count:**300

Biography: Andrew Cheney was an undergraduate at Eastern Washington University where he graduated cum laude with a Bachelor of Science in Athletic Training and a Bachelor of Science in Exercise Science. He is currently a Graduate Assistant Athletic Trainer at South Dakota State University. While in this position, he is working toward a Master of Science in Sport and Recreation Administration. He is a Certified Athletic Trainer with a South Dakota state license and a NATA member. Also, he is Rocktape Functional Movement Technique certified. He has had professional ATC experience with the Seattle Seahawks along with collegiate Division 1 football and track and field/cross country. His future plans are to work toward becoming an Athletic Trainer with a Division 1 football team.

Title: Establishing a Sustainable Nutrition Education Program for Young Children

DeLay A, Jensen B, Wede K, Pappadackis P, Buchholz K; South Dakota State University Brookings, South Dakota

Presenter: Alli DeLay **Advisor:** Becky Jensen

Objective: Establish a sustainable nutrition education program for young children in the Brookings, SD community which benefits program participants, meets partnering organization's goals, and provides a learning experience opportunity for dietetic interns to meet educational competencies. **Process:** South Dakota State University (SDSU) Nutrition and Dietetics Internship (NDI) students as part of the NDI's Community Outreach Program developed a partnership with the Boys & Girls Club in Brookings, SD to provide nutrition education for preschool-3rd grade participants. Literacy focused nutrition education has been effective in improving nutrition related health behaviors in young children. The iGrow Readers



curriculum, developed by SDSU Extension, was utilized to provide 6 weekly lessons to 30 preschool children and 20 1st-3rd grade children as part of the participants regularly scheduled educational programming. Each lesson included reading a children's book followed by a nutrition and physical activity related to the book's key theme. Parent newsletters were also sent home with participants. **Outcomes:** Dietetic intern's utilized lesson plan objectives to ask follow up questions at the next lesson to gather qualitative information on overall interest and application of any nutrition behaviors that may have occurred in the participant's home. Intern's noted increasing eagerness among participants to engage in the lessons as the project progressed. Staff expressed appreciation for the intern's being well-prepared and providing the children with fun lesson plans each week and welcomed continuation of the program. Dietetic intern reflections revealed increased confidence in facilitating a new pilot program. **Conclusion:** The NDI Community Outreach Project was successful in establishing a community partner where provision of a nutrition education program to young children can be provided on a sustainable basis with future dietetic intern groups. Determination of outcomes was limited to informal qualitative statements from participants and staff. The interns will provide mentorship to the new intern group for continuing the program with suggestions for implementation of a lesson objective assessment tool for measuring participant responses as well as a follow-up survey provided to staff.

Biography: Alli is pursuing her Master of Science degree in Nutrition and Exercise Science at South Dakota State University with plans to graduate in May 2020. In the fall, she will begin her Dietetic Internship in Sioux Falls, SD. Alli recently received her Bachelor's degree in Nutrition and Dietetics. Alli's future goals include becoming a Registered Dietitian and working with children.

Detecting Cardiac Pathology to Prevent Sudden Cardiac Death (SCD) in Athletes: The Role of ECG Implementation.

Finke AO, Roiger TC: South Dakota State University, Brookings, SD

Presenter: Alyssa Finke

Advisor: Trevor Roiger

Context: Sudden cardiac death (SCD) represents the leading cause of sport-related death in athletes. Current guidelines for cardiac screening include the identification of cardiac-related signs and symptoms, personal and family history of cardiac pathology, and a physical examination (PE) that includes heart rate, blood pressure and auscultation. Despite the common use of history and PE to detect cardiac pathology, the effectiveness of these measures remains questionable. **Objective:** Is an electrocardiogram (ECG), cardiac history and PE more effective than cardiac history and PE alone in detecting underlying cardiac pathology in collegiate athletes? **Data Sources:** The databases searched included PubMed, MEDLINE, Web of Science and Google Scholar for articles published from 2008-2018. Key words included ECG, cardiovascular screening and collegiate athletes. **Study Selection:** Studies were included if they compared diagnostic accuracy of history and PE to history, PE and ECG, were conducted on college athletes, were level 3 evidence or higher, and were published in the last 10 years. **Data Extraction:** Three studies met all inclusion criteria. The studies were analyzed and rated according to the 2011 Level of Evidence Scale and Strength of Recommendation Taxonomy (SORT). **Data Synthesis:** Moderate to strong evidence supports the use of ECG to improve the diagnostic accuracy of cardiac screening in collegiate athletes. Cardiac screenings incorporating ECG, history, and PE have demonstrated improved sensitivity to detect potentially lethal cardiac pathology as compared to history and PE alone. **Conclusions:** The specificity of ECG to detect cardiac pathology is significantly enhanced when revised interpretation criteria specific to the athletic population are utilized. All three studies concluded that adding ECG to history and PE during a cardiac screening improved the diagnostic accuracy to detect serious cardiac pathologies that would have been missed with history and PE only.

Biography: Alyssa O'Neil Finke attended Winona State University and graduated magna cum laude with a Bachelor of Science in Athletic Training and a minor in Psychology. She is currently attending South Dakota State University. She will graduate in May and receive a Master of Science in Nutrition and Exercise Science with an exercise science specialization. She is a certified athletic trainer with a South Dakota state licensure. She currently works as a graduate assistant athletic trainer at South Dakota State University working with the softball, cheer and dance teams. She is currently pursuing full-time job opportunities as a collegiate athletic trainer.



Does and increase in cervical muscle strength reduce the incidence of concussion in collegiate women's soccer players?

Reece KM, Zwart MB: South Dakota State University Brookings, SD

Presenter: Kaitlin Reece

Advisor: Mary Beth Zwart

Context: An estimated 300,000 sport related concussions occur annually in the United States. Along with that, women's soccer is the source of the highest concussion rates among female athletes. Five to 22% of high school and collegiate soccer injuries each year are concussions. **Objective:** Will implementing a cervical strength program for women's collegiate soccer athletes reduce the incidence of concussions? **Data Sources:** An electronic database search was conducted using PubMed, Google Scholar, Medline, CINAHL, and Cochrane Libraries. The following search terms were used; women's collegiate soccer, soccer, neck strength, cervical musculature strength, concussion, risk reduction, and concussion incidence. **Study Selection:** Studies were included if they assessed neck strength measures, neck strength related to concussion, articles in English text, CEBM level of evidence 2 or higher, and full free text. Studies were excluded if they were completed on animals. **Data Extraction:** One systematic review and three cohort studies were appraised. **Data Synthesis:** Both strength and conditioning coaches and collegiate soccer coaches should be informed that further research is needed to evaluate the effects on neck strength and its relationship on concussion incidence. Current research indicates that anticipated versus unanticipated force application plays a bigger role in head displacement than cervical strength. Therefore, conditioning programs should incorporate anticipated force applications into their training regimens. These exercises would include isometric contractions of the neck musculature. **Conclusions:** Greater neck strength can reduce the magnitude of head's kinematic response. The studies showed that greater cervical strength did not enhance head-neck segment dynamic stabilization during force application or lower the impact severity of hits to the head in collegiate soccer players. Evidence is lacking on the relationship between head kinematics and incidence of concussions. Therefore, additional research is needed to determine if cervical neck strength will impact the incidence of concussions in female soccer players. **Word Count:** 299

Biography: Kaitlin is a student in the Master of Science Athletic Training program. She is from Valentine, Nebraska where she helps on the family ranch. Kaitlin graduated from Hastings Nebraska in 2017 with a major in health systems and a minor in psychology. She was an active member on the rodeo team for both Hastings College and here at State. Her ideal job would be one that incorporates her services as an athletic trainer in the sport of rodeo. Kaitlin will be on a Quiz Bowl team representing District 5 at the NATA conference in Las Vegas this summer. Currently, she is waiting for a response on a potential job at a chiropractic center.

Session 3: 10:00am-10:50am

Teaching adults with disability to prepare healthy foods to increase independence and improve quality of dietary intake

Elfmann J, Jensen B, Carmody B, Willhite T, Venjohn A: South Dakota State University, Brookings, South Dakota

Presenter: Jacob Elfmann

Advisor: Becky Jensen

Objective: Individuals with physical and cognitive disabilities are more likely to be overweight or obese than the general population. As a part of South Dakota State University's (SDSU) Nutrition & Dietetics Internship (NDI) Community Outreach Projects, adults with disability from Advance in Brookings, SD were taught how to prepare nutritious meals in order to increase independence and improve quality of dietary intake. **Program Design:** Dietetic Interns delivered nutrition education and supervised practice in food preparation for adults with various physical and cognitive disabilities. Course curriculum was adapted from Healthy Eating Adds Up™, a program developed for adults with developmental disabilities by Chwen Johnson, MS, RD that accommodates a spectrum of physical and cognitive ability. **Outcomes:** Lessons covering fruits, vegetables, dairy products, protein sources, grain products, and healthy beverages were delivered to thirty-five total individuals with disability over thirteen total one-hour sessions between October 2018 and March 2019. Learning sessions were categorized into food groups with accompanying recipes that reflected that week's topic. The primary barriers reported by class participants were reliance upon caregivers for purchasing food and preparing a majority of their meals. **Results:** Inclusion of parents, guardians, and caregivers was identified as an important factor for designing effective interventions to deliver nutrition education and practice food preparation with adults with disabilities. An additional goal of this program was to determine perceived importance and satisfaction of the intervention by program coordinators at



Advance. Conclusions: Caregivers have the ability to reinforce learning concepts and provide opportunities for class participants to practice preparing recipes in their home. Future interventions by SDSU NDI interns should include caregivers and guardians in order to overcome important barriers related to independently obtaining healthy food and assistance with food preparation.

Biography: Jacob Elfmann is a graduate student completing his Master's in Nutrition and Exercise Science as a part of South Dakota State University's Nutrition and Dietetic Internship. Upon completion of the program, Jacob will be eligible to take

the registration examination to become a Registered Dietitian and hopes to use his education to help others understand the importance of food and nutrition in maintaining good physical and mental health.

Early Single-Sport Specialization and the Correlation of Athletic Success: A Literature Review.

Froseth, MF, Romsa, BL: South Dakota State University, Brookings, SD

Presenter: Maggan Froseth **Advisor:** Bryan Romsa

Context: Findings from peer-reviewed articles published within the last 15 years examine the correlation of athletic success to early single-sport specialization. The study of early single-sport specialization is significant for sport professionals to better understand the future of sport and physical activity among the youth today. **Objective:** Does early single-sport specialization have a positive or negative correlation to athletic success? **Data Sources:** An electronic databases search included Web of Science Core Collection, Physical Education Index, OregonPDF in Health & Performance, and ERIC (Education Resources Information Center) from 2004-2018. Key words included specialization, participation, youth, early, adolescent, single-sport, multi-sport, overuse injuries, athletes, recruiting, sport, training, sampling, and puberty. Limits: English, articles older than 15 years. **Study Selection:** Studies met standards if the authors included discussion of single-sport specialization, organized sport participation, sampling, and/or injuries because of early single-sport specialization, and were published in the last 15 years. Exclusion criteria included studies not examining early single-sport specialization. **Data Extraction:** The database search identified over 25 studies that met inclusion criteria, including studies that considered the positives of organized sport participation. These studies were examined for key factors that categorized early single-sport specialization to have a positive or negative correlation to athletic success. **Data Synthesis:** There are many benefits of organized sport participation among young athletes, but the negatives of early single-sport specialization included physical, sociological, and psychological implications, impairment of overall athleticism, and a lack of correlation to a success athletic career as an adult. **Conclusions:** Through the analyzation of early single-sport specialization, it is found that the benefits of sport participation among young athletes is heightened during multi-sport participation as opposed to single-sport specialization.

Biography: Maggan Froseth is a student in the M.S. Sport and Recreation Administration program. Since graduating from South Dakota State University in 2014 with a degree in Sport, Recreation, and Park Management, Froseth has worked with the Minnesota Swarm (NLL) and the Brookings Blizzard (NAHL). Froseth is currently the Director of Marketing with South Dakota State Athletics, after working in the Jackrabbit Ticket Office for a year as a Graduate Assistant.

Eat Smart Live Strong: Increasing Fruit and Vegetable Consumption and Physical Activity Among Older Adults Through Community-Based Intervention

Nurnberg K, Jensen B, Weihe K, Short E: South Dakota State University Brookings, South Dakota

Presenter: Kala Nurnberg **Advisor:** Becky Jensen

Objective: The aim of this project was to implement a community-based nutrition and physical activity education program for older adults in the Brookings, South Dakota community. **Process:** South Dakota State University (SDSU) Nutrition and Dietetic Internship (NDI) students provided the Eat Smart, Live Strong curriculum as part of their NDI Community Outreach Project (COP) at the Brookings Community Center and Brookhaven Estates in Brookings, South Dakota. Eat Smart, Live Strong consists of curriculum developed by Supplemental Nutrition Assistance Program (SNAP) Education. The program encourages older adults to increase fruit and vegetable intake as well as physical activity. Six, one-hour meetings were held for both the fall and spring sessions where eight older adults ages 65+ participated in the program. Participants were asked to complete goals, participate in lessons, and provide feedback at the end of each session. **Outcomes:** Program participants



were asked to fill out weekly goal and progress logs that accounted for both fruit/vegetable intake and physical activity. At the beginning of each session, habits from the previous week were assessed and new goals were set accordingly. Participants were asked to discuss new foods and exercises that related to program goals. Surveys were completed at the end of each session with questions based on a five-point scale (strongly agree to strongly disagree) related to program goals. **Results:** Self-reported increases in fruit and vegetable consumption physical activity occurred for all participants involved in the program. Seven out of eight participants expressed their agreement to continue increasing fruit and vegetable consumption, while only five out of eight participants expressed their agreement to increase physical activity following the program. **Conclusion:** Community-based interventions with a goal setting component for older adults may be an effective method for increasing fruit and vegetable consumption and physical activity.

Biography: Kala is pursuing her Master of Science degree in Nutrition and Exercise Science at South Dakota State University with plans to graduate in May 2020. In August, she will begin her Nutrition and Dietetic Internship in Pierre, South Dakota. Kala received her Bachelor of Science degree in Nutrition and Dietetics and Health Science minor from South Dakota State University in August 2018. Future goals for Kala include being a Registered Dietitian in a clinical or long-term care setting.

Validity Between International Physical Activity Questionnaire (IPAQ-SF) and Measured Physical Activity in US Adolescents

Thompson K, Kattelman K, Zhou W, Colby S, Olfert M, Crouter S, Byrd-Bredbenner C, Hicks D: South Dakota State University, Brookings, South Dakota

Presenter: Keith Thompson **Advisor:** Kendra Kattelman

Background: With the increase of sedentary behavior in adolescents, validating a questionnaire to assess physical activity levels in this population is important for research and intervention efficacy. The aim of this study is to evaluate the validity of the International Physical Activity Questionnaire- Short Form (IPAQ-SF) in relation to measured physical activity utilizing an accelerometer (ActiGraph GT3X+) in adolescents.

Study Design: A cross-sectional convenience sample of participants (n=200) enrolled in a health and well-being program (GetFruved) were assessed for physical activity behaviors (IPAQ-SF) in relation to measured physical activity (ActiGraph GT3X+).

Methods: Participants completed both the questionnaire and accelerometer requirements (n=200). The correlation between the IPAQ-SF and ActiGraph GT3X+ were determined using Spearman's ρ (SM) and Kendall's τ (KD).

Results: Low, positive correlations were determined in all physical activity levels for females and males (KD=0.01-0.26, $p < 0.05$; SM=0.01-0.33, $p < 0.05$). Females were determined to have a moderate, positive correlation for vigorous physical activity (SM=0.33, $p < 0.05$).

Conclusions: Physical activity behaviors assessed by a questionnaire (IPAQ-SF) differed from the objective measurement method (ActiGraph GTX3+). Validating a questionnaire such as the IPAQ-SF can be a useful and cost-effective assessment of physical activity in large cohort studies.

Biography: Keith Thompson is a non-traditional student who received his Bachelor of Science in Dietetics May 2017 at South Dakota State University. He is now completing the SDSU Nutrition and Dietetic Internship that is combined with a Master of Science in Nutrition/ Exercise Science degree. During his graduate experience, Keith received the graduate certificate in Transdisciplinary Childhood Obesity Prevention. While obtaining his undergraduate degree, Keith worked at an 81-bed long term care facility. He started his work experience as a dietary aid and was quickly promoted to cook and ultimately the Interim Director of Nutrition. Keith's future goals are to become a Registered Dietitian focusing in either clinical or long-term care.

Session 4: 11:00am-11:50am

Dynamic Pricing Strategy for South Dakota State University Athletic Facility Rentals Determined by Peak and Non-Peak Hours

Andersen D, Drietz J: South Dakota State University Brookings, South Dakota

Presenter: David Andersen **Advisor:** Hung-Ling (Stella) Liu



Objective: The aim of this research was to construct a dynamic pricing strategy for the athletic department to utilize when renting out their facilities to groups on campus as well as in the community. The intent was to create

a comprehensive baseline that fluctuates to represent higher cost in times of peak demand and then lower cost in times of low or non-peak demand. **Research Design:** Research for this tool was conducted through in-depth communication with a diverse population of peer institutions ranging from fieldhouses, arenas, and stadiums to the likes of botanical gardens, convention centers and recreational parks. These institutions were all consulted for their differing business practices on rental rates, unit availability, size of facilities, duration of events and overall demand for use in both peak times as well as times of lesser demand. These institutions were selected because they utilized facilities that were at a comparable level to what is offered here at South Dakota State University. **Outcome:** This research allowed for the construction of a dynamic pricing tool that fluctuated its rental rates based on the time of year, the location, the demand and the duration of the event in question. This tool enabled the athletic department to enact a standard baseline for rental rates in all times of year for both university entities as well as community entities that wished to utilize the campus facilities. **Conclusions:** Knowledge of the relationship between these factors and how they fluctuate during peak and non-peak hours can be further used by other institutions to assist in the optimal utilization of their campus facilities. These results are specific to SDSU and its current facilities and should not be implemented by other institutions unless specific alterations are made to align their needs with the data.

Biography: Dave Andersen is a Masters student in the Sport and Recreation Administration program. He progressed toward his degree while working full-time for the SDSU athletic department as an Associate Director for Development. He was responsible for handling the Jackrabbit Club, premium seating sales, scholarship endowments and overseeing the Letterwinners Club for former student-athletes. Andersen was part of a three-man athletic development team that shattered fundraising goals three years running, setting record highs in annual fund, sport specific, and scholarship auction donations. A native of Edina, Minnesota, Andersen graduated *summa cum laude* with a bachelor's degree in Sport Management from Wayne State College in 2016 before joining the Jackrabbits. He plans to continue pursuing his career inside of collegiate athletics with aspirations to lead his own athletic department. He would like to thank his advisor, Stella, for her patience and his family and friends for their enduring support in difficult times.

Barriers and Facilitators of Weight Management in Children with Down Syndrome

Kratovil S, Droke, E, Kattelmann K: South Dakota State University Brookings, South Dakota

Presenter: Samantha Kratovil **Advisor:** Elizabeth Droke

Objective: The aim of this study was to gather preliminary data by conducting in-depth phone interviews with parent(s) of a child with Down Syndrome, in order to determine barriers and facilitators of weight management. **Study Design and Participants:** Phone interviews were conducted by the researcher to gather qualitative data about children with Down Syndrome and their eating and physical activity behaviors. Fourteen participants were enrolled for phone interviews and were queried for eating and physical activity behaviors their child displays on a regular basis. **Outcomes/Analysis:** The results from the study are of qualitative nature, and the software program used to analyze the results was NVIVO. **Results:** Researchers were expecting to find more barriers versus facilitators, which was not the case. After analyzing the data, there were four major themes in terms of barriers: lack of fullness signals, decreased muscle tone, screen time, and time management. There were six major facilitators: three meals every day, readily available fruits and vegetables, being highly active, peers and friends participating in physical activity, encouragement of play from parents, and routine. **Conclusions:** Despite the numerous facilitators mentioned by parents, most children, 61.5%, in the study were still overweight or obese according to the CDC's standard thresholds of the 95th percentile for obesity and the 85th percentile for overweight in age for weight growth charts. The results from this study are limited due to the lack of variance in demographic data. This was only a preliminary study, so future research on this topic is needed. Diverse demographic data is needed to better understand what parents face in terms of barriers and facilitators of weight management for their child with Down Syndrome. With diverse data, the results could help future research by implementing weight management programs for children with Down Syndrome and their families.

Biography: Samantha Kratovil is a Brookings native who will be graduating with her Master of Science in Nutritional and Exercise Science with an emphasis on Nutritional Sciences in May. She completed her undergraduate degree in Dietetics here at SDSU in May of 2017. She has wanted to be a Registered Dietitian since she was a freshman in high school and is only a few steps away from achieving her goal. After she passes her boards this summer, she has a job lined up to work for



the VA, in an outpatient clinic in Watertown, SD. She is excited to start her career and grateful for the opportunities SDSU gave her throughout her schooling.

Associations Between Child Perceptions of Physical Activity Supports and Barriers and Measured Physical Activity in Rural 3rd – 5th Grade Children

Meier M, Kattelman K, Meendering J, McCormack L: South Dakota State University Brookings, South Dakota

Presenter: Makenna Meier **Advisor:** Kendra Kattelman

Objective: Little is known about the relationship between child perceptions of supports and barriers to physical activity (PA) and objectively measured PA levels in this age group. This study examined potential factors that support or hinder measured PA in rural 3rd – 5th grade children. **Methods:** Data were collected from children in two rural South Dakota communities. Actigraph GT3x accelerometers measured PA and sedentary time (ST). Child perceptions of parent support and peer influence, child perceived barriers and benefits, and child perceived value of PA were assessed using a modified version of the Project EAT questionnaire. **Results:** After controlling for sex, age, and BMI percentile, encouragement from mothers, fathers, and friends to be physically active decreased minutes per day of ST and increased minutes of vigorous PA (VPA). The perception of not knowing how to do PA was associated with decreased minutes of VPA and minutes of moderate-to-vigorous PA (MVPA). Perceptions that PA would be fun were associated with decreased ST and increased minutes of light PA (LPA), moderate PA (MPA), VPA, and MVPA. **Conclusions:** Encouragement from mothers, fathers, and friends along with understanding how to perform the PA children want to do play an integral role in decreasing sedentary behavior in these children. To realize positive outcomes, it is important to reinforce to parents their influence on their child's PA levels and provide opportunities in schools for children to learn fundamental movement skills to enhance PA in adolescence and onto adulthood.

Biography: Makenna is a current graduate student and dietetic intern in the Health and Nutritional Sciences program majoring in Nutrition and Exercise Science. She recently completed her Nutrition and Dietetics Internship rotations in Rapid City, South Dakota. Prior to SDSU, she obtained her Bachelor of Science degree in Dietetics from the University of Northern Colorado in May 2017. Upon graduation, Makenna plans to move to Colorado and study for the RD exam in hopes of finding a job as a Registered Dietitian. She would love to work as a clinical dietitian at a hospital or as a sports dietitian counseling and educating collegiate athletes in the future.

Omega-3 Fatty Acids: Awareness, Knowledge, and Status in Young Adults

Presenter: Lezlie Pommer **Advisor:** Elizabeth Droke

Pommer L, Droke E, Born S, Kelly H, Hommes A: South Dakota State University Brookings, South Dakota

Objective: The aim of this pilot study was to evaluate the awareness, knowledge, intake status of Omega-3 fatty acids (n-3 FAs), and omega-3 index (O3I) in young adults attending a local university. **Study Design, Setting and Participants, and Intervention:** A cross-sectional sample of students (n=75), ages 18-25, enrolled in the undergraduate population at South Dakota State University were recruited to participate in a pilot study to assess the knowledge, awareness, and intake of n-3 FAs in young adults. Participants completed: n-3 FAs Food Frequency Questionnaire and a Nutrition Knowledge and Awareness Questionnaire. Participants were also given the option to participate in a blood draw for the O3I (n=36). **Results:** Awareness of n-3 FAs existed in 77.3% of participants. Identification of salmon as the best food choice for n-3 FAs was correctly identified by 70.6% of participants. Identification of n-3 FAs as beneficial for health was only selected by 16% of participants. The estimated self-reported intake of n-3 FAs in participants was 60.11 [Symbol] 70.33 mg/day. The O3I status of participants (n=36) was equated to be 3.89 [Symbol] 0.61 mg/day. **Conclusions:** The findings of this pilot study concluded insufficient intake of n-3 FAs in young adults. Further research should be called to assess facilitators and barriers to knowledge, awareness, and consumption of n-3 FAs in young adults. Future research projects should address possible interventions to increase the consumption of n-3 FAs in young adult populations.



Gut Microbiota: Emerging Research and Its Influence on Chronic Disease

Nack A: South Dakota State University, Brookings, South Dakota

Presenter: Amanda Nack

Advisor: Kendra Kattelman

Objective: The aim of this review is to explore gut microbiome composition and its association to risk of chronic disease as well as expand on factors that may alter composition and outcome of disease. **Methods:** An extensive literature search was conducted utilizing scientific databases including PubMed, Science Direct and Frontier. Articles were selected based on their

abstract containing findings on factors contributing to gut microbiome composition or the association of disease to gut microbiome composition. **Results and Discussion:** Within this review, alterations in immunity and increased risk for inflammatory bowel disease, obesity, and cancer are specifically discussed in terms of their association to altered gut microbiome. Over the past decade, research has produced consistent and strong findings that suggest the composition of gut microbiome is associated to human risk of chronic disease. The composition of human gut microbiome changes throughout the life span and specifically, research confirms genetic predisposition and environmental factors play a significant role in the composition of human gut microbiome. When these factors are present, diversification of gut microbiome reduces and the risk for chronic disease increases. Research has confirmed obesity, inflammatory bowel disease, diabetes mellitus, cancer and other diseases appear to be associated with altered gut microbiome. Research has produced consistent evidence suggesting alteration of gut microbiome through dietary selections, addition of prebiotics and probiotics, fecal transplantation or through environmental factors is associated with reduced risk and treatment of chronic disease. **Summary:** Evidence suggests alterations in gut microbiome may increase an individual's risk and outcome of chronic disease. A limitation that remains is the difficulty of confirming whether shifts in microbiota resulting in inflammation are universal. Further advancements are necessary to allow for standardization of how specimens are sampled, how DNA is extracted, and what bioinformatic tools are consistently utilized to assure reproducibility and comparable data.

Biography: Amanda Nack is Licensed Registered Dietitian currently working on completion of her Master's Degree in Nutritional Sciences. Amanda received her Bachelor's degree in Dietetics from Concordia College in Moorhead, MN and resides in Fargo, ND where she works as a Clinical Dietitian. She has been working in the field of eating disorders for the past two years. Her background encompasses a variety of populations within the clinical setting. Working in an acute setting and outpatient setting, she has provided medical nutrition therapy to individuals of all ages with various diagnoses and nutritional concerns. She participates in television and radio media segments to educate and share information on various topics within the local community. Amanda is an active board member for North Dakota Academy of Nutrition and Dietetics and strives to remain engaged in dietetic professional organizations both at the state and national level.